Amendments to the Claims:

Claims 122-151 have been provided with the proper status identifier.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-121 (canceled)

122. (Currently amended) A tunable boundary detector for detecting features in a source image, the boundary detector comprising:

a tunable low-pass filter for filtering the source image to provide a filtered image;

an adjustable image sub-sampler for sub-sampling the filtered image to provide a sub-sampled image; and

~~a single-frequency~~ an edge detector for detecting edges in the sub-sampled image to provide edges, each edge having an edge position, a gradient magnitude, and a gradient direction.

123. (Previously presented) The tunable boundary detector of claim 122, wherein the position is expressed as real-valued coordinates.

124. (Previously presented) The tunable boundary detector of claim 122, wherein the image sub-sampler is controlled by a plurality of parameters.

125. (Previously presented) The tunable boundary detector of claim 122, wherein the sub-sampling amount of the image sub-sampler is controlled by at least one parameter.

126. (Previously presented) The tunable boundary detector of claim 122, wherein the constant-time low-pass filter is controlled by a plurality of parameters.

127. (Previously presented) The tunable boundary detector of claim 122, wherein the source image is one of a training image and a run-time image.

128. (Previously presented) The tunable boundary detector of claim 122, wherein the low-pass filter is a constant-time low-pass filter using substantially similar computational time over a range of adjustments of the filter.

129. (Previously presented) The tunable boundary detector of claim 122, wherein the low-pass filter is a second-order low-pass filter.

130. (Previously presented) The tunable boundary detector of claim 122, wherein the low-pass filter is substantially an approximation to a Gaussian low-pass filter.

131. (Previously presented) The tunable boundary detector of claim 122, wherein the low-pass filter is substantially an approximation to a parabolic low-pass filter.

132. (Currently amended) The tunable boundary detector of claim 122, wherein the ~~a single frequency~~ edge detector comprises:

a gradient estimator ~~adapted~~ configured to provide an estimate of horizontal and vertical components of image gradient at each pixel position;

a Cartesian-to-polar converter ~~adapted~~ configured to convert each estimate of horizontal and vertical components of image gradient into an estimate of gradient magnitude and gradient direction;

a peak detector ~~adapted~~ configured to use each estimate of gradient magnitude and gradient direction to identify points where the gradient magnitude is a local maximum, and to provide a column number, a row number, a gradient magnitude and a gradient direction for each such point; and

a sub-pixel interpolator ~~adapted~~ configured to use each column number, row number, gradient magnitude and gradient direction to provide a vertical component of real valued edge position, a horizontal component of real valued edge position, a gradient magnitude, and a gradient direction for each such point.

133. (Previously presented) The tunable boundary detector of claim 132, wherein the peak detector can be adjusted using a plurality of parameters.

134. (Previously presented) The tunable boundary detector of claim 132, wherein a noise threshold of the peak detector is adjusted using a parameter.

135. (Previously presented) The tunable boundary detector of claim 132, wherein the sub-pixel interpolator can be adjusted using a plurality of parameters.

136. (Previously presented) The tunable boundary detector of claim 132, wherein the Cartesian-to-polar converter uses a CORDIC method to compute gradient magnitude and direction.

137. (Previously presented) The tunable boundary detector of claim 132, wherein the Cartesian-to-polar converter computes both gradient magnitude and gradient direction to at least six bits.

138. (Previously presented) The tunable boundary detector of claim 132, wherein the gradient estimator computes the x and y components of gradient to 16 bits.

139. (Previously presented) The tunable boundary detector of claim 132, wherein the gradient estimator uses a Sobel kernel.

140. (Previously presented) The tunable boundary detector of claim 132, wherein the gradient estimator receives a 16-bit filtered image.

141. (Previously presented) The tunable boundary detector of claim 132, wherein the gradient estimator receives a 8-bit unfiltered image.

142. (Previously presented) The tunable boundary detector of claim 132, wherein the peak detector identifies a plurality of points where the gradient magnitude exceeds a noise threshold and is a local maximum along a one-dimensional profile that lies in approximately the gradient direction, and provides grid coordinates, gradient magnitude, and gradient direction for each such point.

143. (Previously presented) The tunable boundary detector of claim 142, wherein the sub-pixel interpolator interpolates position of maximum gradient magnitude along the one-dimensional profile to determine real-valued coordinates of each point so as to provide a plurality of points that lie along boundaries in the source image, including the grid coordinates, gradient direction, and gradient magnitude of each point.

144. (Previously presented) The tunable boundary detector of claim 122, wherein a parameter of the low-pass filter is set to pass fine detail so as to provide a high-resolution pattern.

145. (Previously presented) The tunable boundary detector of claim 122, wherein a parameter of the low-pass filter is set to attenuate fine detail so as to provide a low-resolution pattern.

146. (Previously presented) The tunable boundary detector of claim 122, wherein a parameter of the low-pass filter is set to disable the low-pass filter.

147. (Previously presented) The tunable boundary detector of claim 122, wherein the source image has eight bits of gray-scale per pixel, and the low-pass filter provides a filtered image having 16 bits of gray-scale per pixel.

148. (Currently amended) A tunable boundary detector for detecting features in a source image, the boundary detector comprising:

a tunable low-pass filter for filtering the source image to provide a filtered image;

a gradient estimator ~~adapted~~ configured to provide an estimate of horizontal and vertical components of image gradient at each pixel position;

a Cartesian-to-polar converter ~~adapted~~ configured to convert each estimate of horizontal and vertical components of image gradient into an estimate of gradient magnitude and gradient direction;

a peak detector ~~adapted~~ configured to use each estimate of gradient magnitude and gradient direction to identify points where the gradient magnitude is a local maximum, and to provide for each such point a column number, a row number, a gradient magnitude and a gradient direction; and

a sub-pixel interpolator ~~adapted~~ configured to use each column number, row number, gradient magnitude and gradient direction to provide for each such point a vertical component of real valued edge position, a horizontal component of real valued edge position, a gradient magnitude, and a gradient direction.

149. (Previously presented) The tunable boundary detector of claim 148, further comprising:

an adjustable image sub-sampler, cooperative with the low-pass filter, for sub-sampling the filtered image to provide a sub-sampled image.

150. (Currently amended) A tunable boundary detection method for detecting features in a source image, the method comprising:

filtering the source image to provide a filtered image;

providing an estimate of horizontal and vertical components of image gradient at each pixel position;

converting each estimate of horizontal and vertical components of image gradient into an estimate of gradient magnitude and gradient direction;

using each estimate of gradient magnitude and gradient direction to identify points where the gradient magnitude is a local maximum, and to provide for each such point a column number, a row number, a gradient magnitude and a gradient direction; and

using each column number, row number, gradient magnitude, and gradient direction to provide for each such point a vertical component of real valued sub-pixel edge position, a horizontal component of real valued sub-pixel edge position, a gradient magnitude, and a gradient direction.

151. (Previously presented) The method of claim 150, further comprising:

after filtering, sub-sampling the filtered image to provide a sub-sampled image.